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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,353	11/19/2001	Xiaodong C. Xu	MTC6788 (39-21 (52589))	8762

321 7590 03/03/2004

SENNIGER POWERS LEAVITT AND ROEDEL
ONE METROPOLITAN SQUARE
16TH FLOOR
ST LOUIS, MO 63102

EXAMINER	
CLARDY, S	

ART UNIT	PAPER NUMBER
1616	

DATE MAILED: 03/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/988,353	XU ET AL.	
	Examiner	Art Unit	
	S. Mark Clardy	1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-32,67,68,70,71,73-76,78,79,84-87,89-92,94,95,97,98,101-123,128-130,140-142,146-148,* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/926,521.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/24/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims rejected are 3-32,67,68,70,71,73-76,78,79,84-87,89-92,94,95,97,98,101-123,128-130,140-142 and 146-148.

Claims 3-32, 67, 68, 70, 71, 73-76, 78, 79, 84-87, 89-92, 94, 95, 97, 98, 101-123, 128-130, 140-142, and 146-148 are pending (see response filed November 24, 2003) in this application which is a continuation in part of SN 09/926,521, which was filed under 35 USC 371 as the national stage application of PCT/US01/16550, filed May 21, 2001, which claims the benefit under 35 USC 119(e) of US Provisional Applications No. 60/206,628 (May 24, 2000), 60/205,524 (May 19, 2000), 60/273,234 (March 2, 2001), and 60/274,368 (March 8, 2001). The following continuation applications have also been filed: 09/988,340; 09/988,352.

Applicants elected the invention/species comprising:

Glyphosate (acid, salt, or ester)

Oxalic acid (as the dicarboxylic acid)[1]

Dialkoxylated Amine Surfactant (formula 36, page 23):

$$C_{1\text{-}30}-N\begin{cases}(C_{2\text{-}4}O)_{1\text{-}40}-H/\,C_{1\text{-}22}\\(C_{2\text{-}4}O)_{1\text{-}40}-H/\,C_{1\text{-}22}.\end{cases}$$

The weight ratio of surfactant to oxalic acid enhancing compound (sf:ox) component is 5:1 to about 40:1 (claim 3).

Claims 35-39, 43-48, 51-54, 57-61, 64-66, 134-136, 143-145 have been canceled.

It is noted that the text of claims 1, 2, 33, 34, 40-42, 125-127, 131-133, and 137-139, withdrawn as being drawn to a non-elected invention, is not provided in the claims listing; these claims are instead simply identified as "withdrawn". Claims 49, 50, 55, 56, 62, 63, 69, 72, 77, 80-83, 88, 93, 96 and 124, withdrawn as being drawn to a non-elected species are similarly

[1]Claims 67, 68, 70, 71, 73-76, 78, 79, 84-87, 89-92, 94, 95, 97, 98, 113-123, 146-148

identified in the claim listing, but without repeating the claim text. Since these claims do not appear in the most recent claim listing, and since applicants refer to their presentation for consideration in another continuation application, these claims are taken as being canceled. Clarification is requested if this was not the intent.

Applicants' invention lies in the discovery that the enhancer compound (i.e., oxalic acid) enhances plant cell membrane permeability, thus enhancing the transport of glyphosate through the phloem resulting in increased phytotoxicity. The mechanism is described as being independent of any metal ion chelating effect (response, p. 41).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-32, 67, 68, 70, 71, 73-76, 78, 79, 84-87, 89-92, 94, 95, 97, 98, 101-123, 128-130, 140-142, and 146-148 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Hasebe et al (US 5,863,863), Beestman et al (US 4,159,901), Wright et al (US 5,750,468), and Turner[2].

Hasebe et al teach liquid enhancer compositions for amino acid series herbicides (i.e., glyphosate (see column 5) comprising oxalic acid or a salt thereof, and a tertiary amine (column 2) which may be a dialkoxylated amine surfactant such as POE(15) beef tallowamine (structure 2, column 7). See also compositions 7-12 of Table 1. The molar ratio of the oxalic acid

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[2] Turner, D. J. "Effects on glyphosate performance of formulation, additives and mixing with other herbicides". Chapter 15 in *The Herbicide Glyphosate*. Grossbard et al, ed. Butterworths : Boston. P. 221-239. 1985.

component to the N-containing surfactant is in the range of 0.1:1 to 10:1 (abstract). In examples 7-12 of Table 1, the molar ratio of N-surfactant to oxalic component (sf:ox) is 1:3, with the disclosed weight ratios (g:g) ranging from 20:5 to 20:17, or about 4:1 to about 1:1 by weight for a molar ratio of 1:3. Calculating for a molar ratio of 1:1, the weight ranges for the examples would be 20:1.7 to 20:5.7, or about 12:1 to 3.5:1; and:

for a 0.1:1 molar ratio: 1.2:1 to 0.35:1

for a 10:1 molar ratio: 120:1 to 35:1.

Thus, on the basis of the disclosed 0.1:1 to 10:1 molar sf:ox ratio and the provided examples, weight ratios, Hasebe et al teach that in terms of weight, the sf:ox ratios range from at least 0.35:1 to 120:1, encompassing applicants' 5:1 to 40:1 range in claim 3.

Beestman et al teach that it was known to formulate glyphosate, or its salts or esters (columns 10-11) with surfactants (column 3), including dialkoxylated alkylamines (lines 51-60), such as ethoxylated tallowamines (see structure of surfactant A, top of column 7). The compositions of Beestman et al contain a thiol compound to reduce corrosion of metal surfaces. This patent also teaches that it was known to add oxalic acid to glyphosate compositions in order to counteract the activity reducing effect of hard water, i.e., calcium or magnesium ions in the dilution water (col 7, lines 38-65). One of ordinary skill in the art would be motivated to combine the specific disclosed salts or esters of glyphosate as taught in Beestman et al with the enhancing composition of Hasebe et al because Hasebe et al is not limited to glyphosate acid, and because the same adjuvant materials are used in the formulations of Beestman et al, albeit for a different purpose. Beestman et al does refer to the utility of oxalic acid for restoring degraded phytotoxicy of glyphosate resulting from calcium or magnesium ions. This reference,

however, is used to show the equivalence of the many different salts and esters of glyphosate as herbicidal agents, and that they may be combined with the alkoxylated alkylamine surfactants and oxalic acid derivatives.

Wright et al teach the combination of glyphosate with etheramine surfactants in concentrate (up to about 500 g ae/l) compositions that may be either liquid or dry (col 5, lines 23-65).

Turner teaches that the addition of surfactants generally improves the activity of glyphosate (p.223-225), and that polybasic acids such as oxalic acid also enhance its activity (p. 230). While this may be attributed to the multivalent metal ion chelating ability of the polybasic acids, the fact remains that they are taught as being useful for enhancing the herbicidal effectiveness of glyphosate. It is not seen where Turner refers to the effect as being one of restoring the effectiveness of glyphosate, which had been degraded by the presence of calcium or other ions. Turner simply states that the activity of glyphosate is enhance by oxalic acid, and suggests that it may be due to its chelating ability. Finally, Turner refers to the various conventional ways in which herbicides may be formulated as liquid (aqueous or oil based) or solid compositions (p. 221-222).

One of ordinary skill in the art would be motivated to combine these references because they disclose the herbicidal enhancing effects of both alkoxylated amine surfactants and oxalic acid in glyphosate compositions. The ordinary artisan would be motivated to combine both the surfactants and oxalic acid derivatives with glyphosate because they enhance glyphosate activity.

Thus it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have combined applicants' elected etheramine surfactants and oxalic

acid derivatives with glyphosate because the prior art teaches that these components were both known to enhance the herbicidal activity of glyphosate. While applicants' mechanism of action is not disclosed in the prior art, it does disclose the combination claimed herein as well as the enhancement of herbicidal activity, thus the claims are obvious over the cited prior art. Inasmuch as several derivatives of glyphosate, oxalic acid, and dialkoxylated alkylamine surfactants are taught in the cited references as being useful in combination, the recited derivatives herein are all seen as obvious over the cited prior art. Further, applicants' weight ratio ranges appear to be encompassed by those of the prior art and are thus seen as being obvious, absent evidence of criticality. Finally, given the conventional nature of liquid and solid formulations in the herbicidal art as taught in Wright et al, the selection of a liquid or solid vehicle for formulating glyphosate would appear to be an obvious variation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Mark Clardy whose telephone number is 571-272-0611. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Mark Clardy
Primary Examiner
Art Unit 1616

March 2, 1004